

Aug. 14, 1951

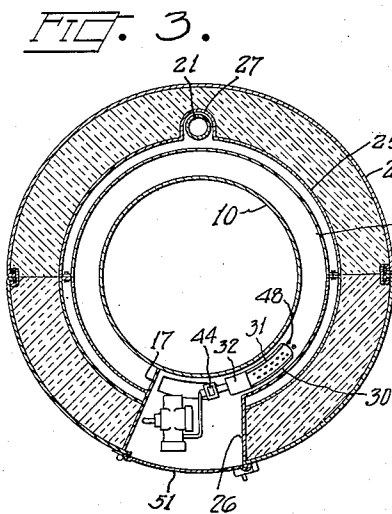
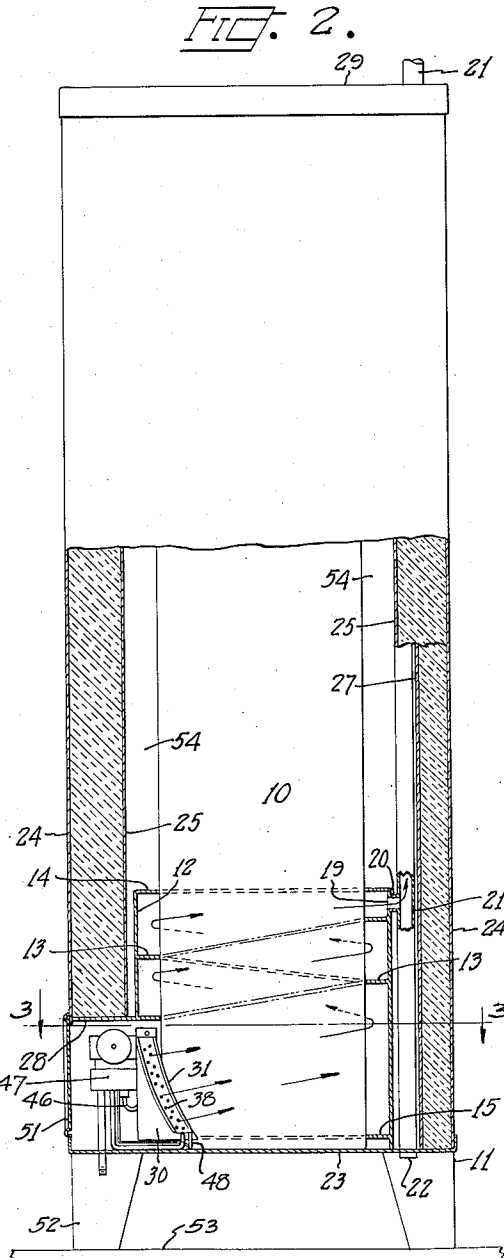
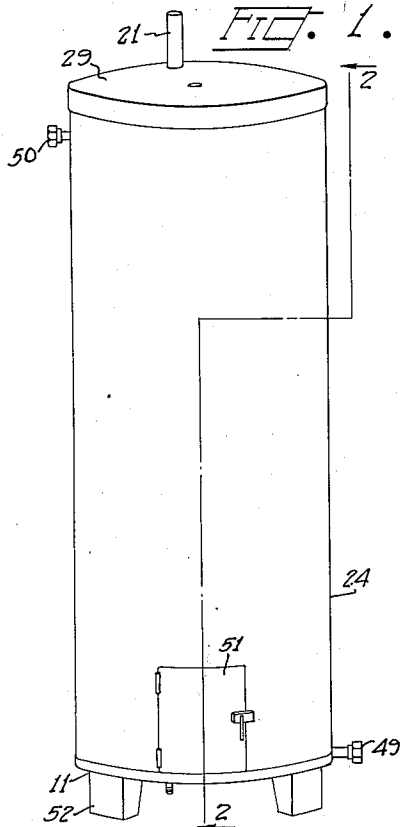
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2,564,358

CONCENTRIC GAS AND AIR BURNER FOR WATER HEATERS

Filed Sept. 29, 1947

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG. 6.

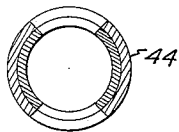
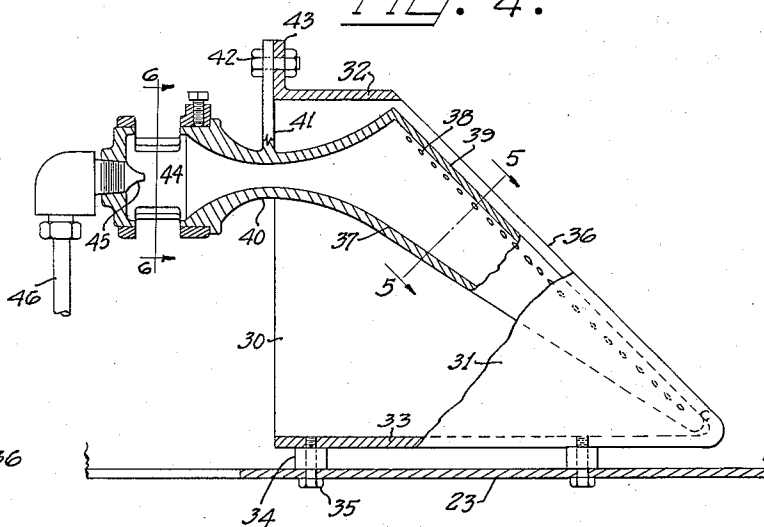
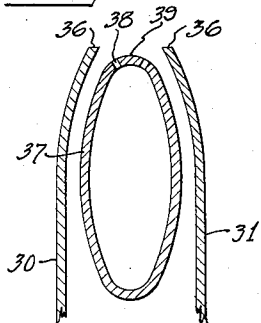


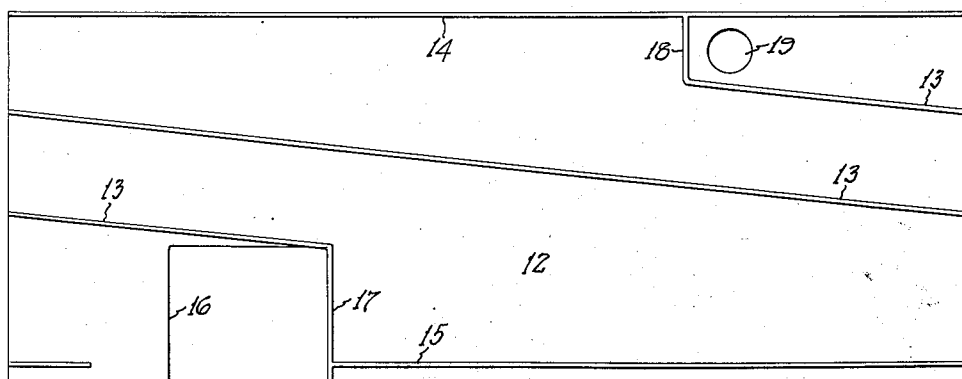
FIG. 4.



~~FIG.~~ 5.



~~File~~ 7.



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CONCENTRIC GAS AND AIR BURNER FOR
WATER HEATERS

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1 Claim. (Cl. 158-110)

1

This invention relates generally to water heaters and particularly to one for burning gas.

The main object of this invention is to provide a water heater especially adapted to the burning of gas in direct contact with the exterior of the tank and to so apply the heat that the major portion of it will be absorbed by the water in the tank before it has had an opportunity to escape to the stack.

The second object is to provide a special form of burner and baffle box which will provide a long flame travel and which will afford a convenient way of cleaning or inspecting or replacing the burner element.

I accomplish these and other objects in the manner set forth in the following specification as illustrated in the accompanying drawing, in which:

Fig. 1 is a perspective view of a heater unit.

Fig. 2 is a side elevation of the heater with parts broken away in vertical section along the line 2-2 in Fig. 1.

Fig. 3 is a horizontal section taken along the line 3-3 in Fig. 2.

Fig. 4 is a section through the burner element.

Fig. 5 is a section taken along the line 5-5 in Fig. 4.

Fig. 6 is a section taken along the line 6-6 in Fig. 4.

Fig. 7 is development of the flue box.

Similar numbers of reference refer to the same or similar parts throughout the several views.

Referring in detail to the drawing, there is shown a common form of water tank 10 mounted on a base 11.

Around the lower portion of the tank 10 is disposed a cylindrical flue box 12 having formed therein a helically wound baffle 13 and closed at its upper end by a ring 14 and partially closed at its lower end by a ring 15.

The shell 12 is provided with a burner door opening 16 along one side of which is a wall 17 which connects with the lower end of the baffle 13.

The vertical wall 18 joins the upper end of the baffle 13 with the ring 14. An outlet opening 19 formed near the wall 18 is connected by the pipe 20 with the vent 21 whose open lower end 22 extends through the bottom 23 of the outer heater casing 24 which is insulated from the inner casing 25 by any suitable insulating material such as glass, cork or fire resisting fibrous materials.

It will be noted that the wall 17 extends radially to the outer casing 24 while the wall 26 extends from the casing 24 to the shell 12.

2

It is desirable to provide the inner casing 25 with a curved portion 27 which extends around the vent pipe 21. A plate 28 forms a top for the door opening 16. The casing 24 has a cap 29 across the top thereof.

The burner housing consists of a curved somewhat triangular pair of walls 30 and 31 which are held in spaced relation by the top 32 and bottom 33, the latter of which is mounted on the feet 34 which rest on the bottom 23 to which the bottom 33 is secured by the screws 35. The inclined edges 36 of the walls 30 and 31 are spaced as shown and between the sloping portions thereof is the burner 37 which is somewhat elliptical as shown in Fig. 5 and provided with perforations 38 on its rounded edge 39.

The burner 37 is supported from its hollow neck 40 on a hanger 41 by the bolt 42 which passes through the lug 43 formed on the top 32. To the neck 40 is attached the mixing valve 44 into which extends the gas tip 45 which is fed by the gas pipe 46 whose valve 47 is controlled by the thermocouple 48 such as are now in common use. The function of the couple 48 is to close the valve 47 whenever the burner temperature falls below a predetermined minimum. Such devices are in common use and are not being claimed herein. Cold water inlet pipe 49 and hot water outlet pipe 50 are indicated as is the door 51 for the opening 16. Legs 52 are provided to hold the tank casing bottom 23 above the supporting surface 53.

The operation of the burner is as follows: Assuming that the burner 37 is being supplied with gas and that the gas is permitted to burn as it flows from the perforations 38, it can be seen that the flame will travel along the path indicated by the arrows in Fig. 2, following a helical path around the bottom of the tank 10 until it has given up the major portion of its heat after which it escapes to the vent 21.

Not only is the burner easy to make and install but it is easy to replace should this become necessary. It will be noted that the air space 54 above the ring 14 and between the tank 10 and casing 25 affords additional insulation for the water tank 10.

I am, of course, aware that numerous forms of gas water heaters have been constructed in the past. I, therefore, do not claim such devices broadly but I do intend to cover such forms and modifications thereof as fall fairly within the appended claim.

I claim:

55 A burner for hot water heaters consisting of

3

an open ended burner housing having a horizontal axis and formed by a pair of walls arcuate in vertical cross section and substantially straight in horizontal cross section, having their concave sides facing each other and held in spaced relation by top and bottom wall members, the rear end of said housing lying in a plane normal to said axis and the other end lying in a plane upwardly and rearwardly inclined, and a hollow burner element disposed between said walls having the front side thereof positioned substantially in the plane of said inclined end and perforated to discharge a gaseous mixture forwardly of said housing, means for supporting said burner element in position between said walls and means for supplying gas and primary air to said burner, said burner element being of elliptical cross section in a plane normal to the incline of the end of the housing.

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